**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Previously Presented) A method of controlling gain applied to an input signal, comprising:

applying gain to the input signal;

estimating a characteristic of the signal with gain; and

selecting one of the input signal and the signal with gain as an output depending on the estimated characteristic, wherein the input signal is selected as the output when the estimated characteristic of the signal with gain is different than a threshold value.

2. (Original) The method of claim 1 wherein the characteristic comprises power level.

3. (Original) The method of claim 2 wherein the signal is selectively coupled to the output when the estimated power level of the signal with gain is above a clipping threshold.

4. (Original) The method of claim 3 wherein the power level estimation comprises averaging the power level for a period of time.

5. (Original) The method of claim 4 wherein the power level estimation further comprises estimating a second power level by averaging the power level of the signal with gain for a second period of time longer than the period of time, the method further comprising adjusting the gain applied to the signal as a function of the second estimated power level.

6. (Original) The method of claim 5 further comprising peak tracking the second estimated power level, wherein the gain adjustment is a function of the tracked peak.

7. (Original) The method of claim 6 wherein the gain adjustment comprises changing a rate of gain adjustment as a function of the tracked peak.

8. (Original) The method of claim 7 wherein the rate of gain adjustment, when the second estimated power level is greater than the tracked peak, exceeds the rate of gain adjustment when the second estimated power level is less than the tracked peak.

9. (Original) The method of claim 7 wherein the rate of gain adjustment is decreased at about 2-4 dB/sec when a reference value exceeds the clipping threshold, the reference value being a function of the tracked peak.

10. (Original) The method of claim 9 wherein the rate of gain adjustment is decreased at about 0.1-0.3 dB/sec when a

reference value is less than the clipping threshold but greater than a predetermined maximum comfort level, the reference value being a function of the tracked peak.

11. (Original) The method of claim 7 wherein the rate of gain adjustment is logarithmically increased at about 0.1-0.3 dB/sec when a reference value is below a predetermined minimum comfort level and above a noise floor, the reference value being a function of the tracked peak.

12. (Previously Presented) A method of controlling gain applied to a signal, comprising:

applying gain to the signal;

estimating a characteristic of the signal with gain;

peak tracking the estimated characteristic;

generating a reference value as a function of the tracked peak, wherein if the signal amplitude increases, the reference value rises relatively quickly and if the signal amplitude decreases, the reference value decreases relatively slowly; and

adjusting the gain applied to the signal as a function of the reference value.

13. (Original) The method of claim 12 wherein the characteristic comprises power level.

14. (Original) The method of claim 13 wherein the power level estimation comprises averaging a power level of the signal with gain for a period of time.

15. (Original) The method of claim 14 wherein the power level estimation further comprises estimating a second power level by averaging the power level of the signal with gain for a second period of time shorter than the period of time, the method further comprising selectively coupling one of the signal and the signal with gain to an output depending on the second estimated power level of the signal with gain.

16. (Original) The method of claim 15 wherein the signal is selectively coupled to the output when the second estimated power level of the signal with gain is above a clipping threshold.

17. (Original) The method of claim 13 wherein a rate of change of an amplitude of the reference value, when the power level is greater than the tracked peak, exceeds the rate of change of the amplitude of the reference value when the estimated power level is less than the tracked peak.

18. (Original) The method of claim 13 wherein a rate of gain adjustment is decreased at about 2-4 dB/sec when the reference value exceeds a clipping threshold.

19. (Original) The method of claim 18 wherein the rate of gain adjustment is decreased at about 0.1-0.3 dB/sec when the reference value is less than the clipping threshold but greater than a predetermined maximum comfort level.

20. (Original) The method of claim 13 wherein a rate of gain adjustment is logarithmically increased at about 0.1-0.3 dB/sec when the reference value is below a predetermined minimum comfort level and above a noise floor.

21. (Original) The method of claim 13 wherein the signal with gain comprises first and second plurality of samples, the first samples preceding the second samples in time, and the reference value generation comprises not changing the reference value if the estimated power level for the second samples exceeds the estimated power level for the first samples by a threshold.

22. (Previously Presented) A signal conditioner for adjusting gain applied to an input signal, comprising:

a combiner to apply gain to the input signal;

an estimator to estimate a characteristic of the signal with gain; and

a bypass to select one of the input signal and the signal with gain as an output of the signal conditioner based on the estimated characteristic, wherein the bypass selects the input signal as the output when the estimated characteristic of the signal with gain is different than a threshold value.

23. (Original) The signal conditioner of claim 22 wherein the characteristic comprises power level.

24. (Original) The signal conditioner of claim 23 wherein the bypass couples the signal with gain to the output of the signal conditioner when the estimated power level of the signal with gain is below a clipping threshold.

25. (Original) The signal conditioner of claim 24 wherein the estimator estimates the power level by averaging the power of the signal for a period of time.

26. (Original) The signal conditioner of claim 25 wherein the estimator estimates a second power level by averaging the power of the signal for a second period of time longer than the period of time, the signal conditioner further comprising a gain calculator that calculates the gain to be applied to the signal based on the second estimated power level of the signal with gain.

27. (Original) The signal conditioner of claim 26 further comprising a peak tracker that tracks the second estimated power level peak and outputs a reference value based on the tracked peak, the gain calculator calculating the gain to be applied to the signal based on the reference value.

28. (Original) The signal conditioner of claim 27 wherein the peak tracker increases an amplitude of the reference value

at a first rate when the second estimated power level of the signal with gain is greater than the reference value, and decreases the amplitude of the reference value at a second rate when the second estimated power level of the signal is less than the reference value, the first rate being faster than the second rate.

29. (Original) The signal conditioner of claim 27 wherein the gain calculator changes a rate of adjustment of the gain applied to the signal as a function of the reference value.

30. (Original) The signal conditioner of claim 26 wherein the gain calculator decrements the gain applied to the signal at a rate of about 2-4 dB/sec when the reference value exceeds the clipping threshold.

31. (Original) The signal conditioner of claim 30 wherein the gain calculator decrements the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is less than the clipping threshold but greater than a predetermined maximum comfort level.

32. (Original) The signal conditioner of claim 29 wherein the gain calculator logarithmically increases the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is below a predetermined minimum comfort level and above a noise floor.

33. (Previously Presented) A signal conditioner for adjusting gain applied to a signal, comprising:

a combiner to apply gain to the signal;

an estimator which estimates a characteristic of the signal with gain;

a peak tracker that tracks the estimated characteristic peak and generates a reference value as a function of the tracked peak, wherein if the signal amplitude increases, the reference value rises relatively quickly and if the signal amplitude decreases, the reference value decreases relatively slowly; and

a gain calculator that calculates the gain to be applied to the signal as a function of the reference value.

34. (Original) The signal conditioner of claim 33 wherein the characteristic comprises power level.

35. (Original) The signal conditioner of claim 34 wherein the estimator estimates the power level by averaging the power level of the signal with gain over a period of time.

36. (Original) The signal conditioner of claim 35 wherein the estimator estimates a second power level by averaging the power level of the signal with gain over a second period of time shorter than the period of time, the signal conditioner further comprising a bypass to selectively couple one of the signal and the signal with gain to an output of the signal conditioner as a

function of the second estimated power level of the signal with gain.

37. (Original) The signal conditioner of claim 36 wherein the bypass couples the signal with gain to the output of the signal conditioner when the second estimated power level of the signal with is below a clipping threshold.

38. (Original) The signal conditioner of claim 34 wherein the peak tracker increases an amplitude of the reference value at a first rate when the estimated power level of the signal with gain is greater than the reference value, and decreases the amplitude of the reference value at a second rate when the estimated power level of the signal with gain is less than the reference value, the first rate being faster than the second rate.

39. (Original) The signal conditioner of claim 33 wherein the gain calculator changes a rate of gain adjustment as a function of the reference value.

40. (Original) The signal conditioner of claim 39 wherein the gain calculator decrements the gain applied to the signal at a rate of about 2-4 dB/sec when the reference value exceeds the clipping threshold.

41. (Original) The signal conditioner of claim 40 wherein the gain calculator decrements the gain applied to the signal

at a rate of about 0.1-0.3 dB/sec when the reference value is less than the clipping threshold but greater than a predetermined maximum comfort level.

42. (Original) The signal conditioner of claim 39 wherein the gain calculator logarithmically increases the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is below a predetermined minimum comfort level and above a noise floor.

43. (Original) The signal conditioner of claim 33 wherein the combiner comprises a multiplier.

44. (Previously Presented) A data transmission system, comprising:

a telephony device which outputs a signal; and

a signal processor comprising a combiner to apply gain to the signal, an estimator to estimate a characteristic of the signal with gain, and a bypass to select one of the signal and the signal with gain as an output of the signal processor based on the estimated characteristic, wherein the bypass selects the signal as the output when the estimated characteristic of the signal with gain is different than a threshold value.

45. (Original) The data transmission system of claim 44 wherein the characteristic comprises power level.

46. (Original) The data transmission system of claim 45 wherein the bypass couples the signal with gain to the output of the signal processor when the estimated power level of the signal with gain is below a clipping threshold.

47. (Original) The data transmission system of claim 46 wherein the estimator estimates the power level by averaging the power level of the signal for a period of time.

48. (Original) The data transmission system of claim 47 wherein the estimator estimates a second power level by averaging the power level of the signal for a second period of time longer than the period of time, the signal processor further comprises a gain calculator that calculates the gain to be applied to the signal based on the second estimated power level of the signal with gain.

49. (Previously Presented) The data transmission system of claim 44 wherein the signal processor further comprises a peak tracker that tracks the second estimated power level peak and outputs a reference value based on the tracked peak, the gain calculator calculating the gain to be applied to the signal based on the reference value.

50. (Original) The data transmission system of claim 49 wherein the peak tracker increases an amplitude of the reference value at a first rate when the second estimated power level of the signal with gain is greater than the reference

value, and decreases the amplitude of the reference value at a second rate when the second estimated power level of the signal is less than the reference value, the first rate being faster than the second rate.

51. (Original) The data transmission system of claim 49 wherein the gain calculator changes a rate of adjustment of the gain applied to the signal as a function of the reference value.

52. (Original) The data transmission system of claim 51 wherein the gain calculator decrements the gain applied to the signal at a rate of about 2-4 dB/sec when the reference value exceeds the clipping threshold.

53. (Original) The data transmission system of claim 52 wherein the gain calculator decrements the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is less than the clipping threshold but greater than a predetermined maximum comfort level.

54. (Original) The data transmission system of claim 51 wherein the gain calculator logarithmically increases the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is below a predetermined minimum comfort level and above a noise floor.

55. (Original) The data transmission system of claim 44 wherein the telephony device comprises a telephone.

56. (Original) The data transmission system of claim 44 further comprising a public switched telephone network coupled between the telephony device and the signal processor.

57. (Currently Amended) A data transmission system, comprising:

a telephony device which outputs a signal; and

a signal processor comprising a combiner to apply gain to the signal, an estimator which estimates a characteristic of the signal with gain, a peak tracker that tracks the estimated characteristic peak and generates a reference value as a function of the tracked peak, wherein the bypass selects the ~~input~~ signal as the output when the estimated characteristic of the signal with gain is different than a threshold value, and a gain calculator that calculates the gain to be applied to the signal as a function of the reference value.

58. (Original) The data transmission system of claim 57 wherein the characteristic comprises power level.

59. (Original) The data transmission system of claim 58 wherein the estimator estimates the power level by averaging the power level of the signal with gain over a period of time.

60. (Original) The data transmission system of claim 59 wherein the estimator estimates a second power level by averaging the power level of the signal with gain over a second period of time shorter than the period of time, and wherein the

signal processor further comprises a bypass to selectively couple one of the signal and the signal with gain to an output of the signal processor as a function of the second estimated power level of the signal with gain.

61. (Original) The data transmission system of claim 60 wherein the bypass couples the signal with gain to the output of the signal processor when the second estimated power level of the signal with is below a clipping threshold.

62. (Original) The data transmission system of claim 58 wherein the peak tracker increases an amplitude of the reference value at a first rate when the estimated power level of the signal with gain is greater than the reference value, and decreases the amplitude of the reference value at a second rate when the estimated power level of the signal with gain is less than the reference value, the first rate being faster than the second rate.

63. (Original) The data transmission system of claim 57 wherein the gain calculator changes a rate of gain adjustment as a function of the reference value.

64. (Original) The data transmission system of claim 63 wherein the gain calculator decrements the gain applied to the signal at a rate of about 2-4 dB/sec when the reference value exceeds the clipping threshold.

65. (Original) The data transmission system of claim 64 wherein the gain calculator decrements the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is less than the clipping threshold but greater than a predetermined maximum comfort level.

66. (Original) The data transmission system of claim 63 wherein the gain calculator logarithmically increases the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is below a predetermined minimum comfort level and above a noise floor.

67. (Original) The data transmission system of claim 57 wherein the telephony device comprises a telephone.

68. (Original) The data transmission system of claim 57 further comprising a public switched telephone network coupled between the telephony device and the signal processor.

69. (Original) The data transmission system of claim 57 wherein the combiner comprises a multiplier.

70. (Previously Presented) A signal conditioner for adjusting gain applied to an input signal, comprising:

means for applying gain to the input signal;

means for estimating a power level of the signal with gain; and

means for selecting one of the input signal and the signal with gain to as an output of the signal conditioner based on the estimated power level of the signal with gain, wherein the input signal is selected as the output when the estimated characteristic of the signal with gain is different than a threshold value.

71. (Currently Amended) The signal conditioner of claim 70 wherein the ~~coupling~~ selecting means couples the signal with gain to the output of the signal conditioner when the estimated power level of the signal with gain is below a clipping threshold.

72. (Original) The signal conditioner of claim 70 wherein the power estimation means estimates the power level by averaging the power level of the signal for a period of time.

73. (Original) The signal conditioner of claim 72 wherein the power estimation means estimates a second power level by averaging the power level of the signal for a second period of time longer than the period of time, the signal conditioner further comprising means for calculating the gain to be applied to the signal based on the second estimated power level of the signal with gain.

74. (Original) The signal conditioner of claim 73 further comprising means for peak tracking the second estimated power level of the signal with gain and outputting a reference value

based on the tracked peak, the gain calculation means calculating the gain to be applied to the signal based on the reference value.

75. (Original) The signal conditioner of claim 74 wherein the peak tracking means increases an amplitude of the reference value at a first rate when the second estimated power level of the signal with gain is greater than the reference value, and decreases the amplitude of the reference value at a second rate when the second estimated power level of the signal is less than the reference value, the first rate being faster than the second rate.

76. (Original) The signal conditioner of claim 74 wherein the gain calculation means changes a rate of adjustment of the gain applied to the signal as a function of the reference value.

77. (Original) The signal conditioner of claim 76 wherein the gain calculation means decrements the gain applied to the signal at a rate of about 2-4 dB/sec when the reference value exceeds the clipping threshold.

78. (Original) The signal conditioner of claim 77 wherein the gain calculation means decrements the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is less than the clipping threshold but greater than a predetermined maximum comfort level.

79. (Original) The signal conditioner of claim 76 wherein the gain calculation means logarithmically increases the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is below a predetermined minimum comfort level and above a noise floor.

80. (Previously Presented) A signal conditioner for adjusting gain of a signal, comprising:

means for applying gain to the signal;

means for estimating a power level of the signal with gain;

means for peak tracking the estimated power level of the signal and generating a reference value as a function of the tracked peak, wherein if the signal amplitude increases, the reference value rises relatively quickly and if the signal amplitude decreases, the reference value decreases relatively slowly; and

means for calculating the gain to be applied to the signal as a function of the reference value.

81. (Original) The signal conditioner of claim 80 wherein the power estimation means estimates the power level by averaging the power level of the signal with gain over a period of time.

82. (Original) The signal conditioner of claim 81 wherein the power estimation means estimates a second power level by averaging the power level of the signal with gain over a second

period of time shorter than the period of time, the signal conditioner further comprising means for selectively coupling one of the signal and the signal with gain to an output of the signal conditioner as a function of the second estimated power level of the signal with gain.

83. (Original) The signal conditioner of claim 82 wherein the coupling means couples the signal with gain to the output of the signal conditioner when the second estimated power level of the signal with is below a clipping threshold.

84. (Original) The signal conditioner of claim 80 wherein gain application means comprises a multiplier.

85. (Original) The signal conditioner of claim 80 wherein the peak tracking means increases an amplitude of the reference value at a first rate when the estimated power level of the signal with gain is greater than the reference value, and decreases the amplitude of the reference value at a second rate when the estimated power level of the signal with gain is less than the reference value, the first rate being faster than the second rate.

86. (Original) The signal conditioner of claim 80 wherein the gain calculation means changes a rate of gain adjustment as a function of the reference value.

87. (Original) The signal conditioner of claim 86 wherein the gain calculation means decrements the gain applied to the signal at a rate of about 2-4 dB/sec when the reference value exceeds the clipping threshold.

88. (Original) The signal conditioner of claim 87 wherein the gain calculation means decrements the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is less than the clipping threshold but greater than a predetermined maximum comfort level.

89. (Previously Presented) The signal conditioner of claim 86 wherein the gain calculation means logarithmically increases the gain applied to the signal at a rate of about 0.1-0.3 dB/sec when the reference value is below a predetermined minimum comfort level and above a noise floor.

90. (Previously Presented) Computer-readable media embodying a program of instructions executable by a computer to perform a method of controlling gain applied to an input signal, the method comprising:

applying gain to the input signal;

estimating a characteristic of the signal with gain; and

selectively coupling one of the input signal and the signal with gain as an output depending on the estimated characteristic, wherein the input signal is selected as the

output when the estimated characteristic of the signal with gain is different than a threshold value.

91. (Original) The computer-readable media of claim 90 wherein the characteristic comprises power level.

92. (Original) The computer-readable media of claim 91 wherein the signal is selectively coupled to the output when the estimated power level of the signal with gain is above a clipping threshold.

93. (Original) The computer-readable media of claim 92 wherein the power level estimation comprises averaging the power level for a period of time.

94. (Original) The computer-readable media of claim 93 wherein the power level estimation further comprises estimating a second power level by averaging the power level of the signal with gain for a second period of time longer than the period of time, the method further comprising adjusting the gain applied to the signal as a function of the second estimated power level.

95. (Original) The computer-readable media of claim 94 wherein the method further comprises peak tracking the second estimated power level, wherein the gain adjustment is a function of the tracked peak.

96. (Original) The computer-readable media of claim 95 wherein the gain adjustment comprises changing a rate of gain adjustment as a function of the tracked peak.

97. (Original) The computer-readable media of claim 96 wherein the rate of gain adjustment, when the second estimated power level is greater than the tracked peak, exceeds the rate of gain adjustment when the second estimated power level is less than the tracked peak.

98. (Original) The computer-readable media of claim 97 wherein the rate of gain adjustment is decreased at about 2-4 dB/sec when a reference value exceeds the clipping threshold, the reference value being a function of the tracked peak.

99. (Original) The computer-readable media of claim 96 wherein the rate of gain adjustment is decreased at about 0.1-0.3 dB/sec when a reference value is less than the clipping threshold but greater than a predetermined maximum comfort level, the reference value being a function of the tracked peak.

100. (Original) The computer-readable media of claim 96 wherein the rate of gain adjustment is logarithmically increased at about 0.1-0.3 dB/sec when a reference value is below a predetermined minimum comfort level and above a noise floor, the reference value being a function of the tracked peak.

101. (Previously Presented) Computer-readable media embodying a program of instructions executable by a computer to perform a method of controlling gain applied to a signal, the method comprising:

applying gain to the signal;

estimating a characteristic of the signal with gain;

peak tracking the estimated characteristic;

generating a reference value as a function of the tracked peak, wherein if the signal amplitude increases, the reference value rises relatively quickly and if the signal amplitude decreases, the reference value decreases relatively slowly; and

adjusting the gain applied to the signal as a function of the reference value.

102. (Original) The computer-readable media of claim 101 wherein the characteristic comprises power level.

103. (Original) The computer-readable media of claim 102 wherein the power level estimation comprises averaging a power level of the signal with gain for a period of time.

104. (Original) The computer-readable media of claim 103 wherein the power level estimation further comprises estimating a second power level by averaging the power level of the signal with gain for a second period of time shorter than the period of time, the method further comprising selectively coupling one of the signal and the signal with gain to an output

depending on the second estimated power level of the signal with gain.

105. (Original) The computer-readable media of claim 104 wherein the signal is selectively coupled to the output when the second estimated power level of the signal with gain is above a clipping threshold.

106. (Original) The computer-readable media of claim 102 wherein a rate of change of an amplitude of the reference value, when the power level is greater than the tracked peak, exceeds the rate of change of the amplitude of the reference value when the estimated power level is less than the tracked peak.

107. (Original) The computer-readable media of claim 102 wherein a rate of gain adjustment is decreased at about 2-4 dB/sec when the reference value exceeds a clipping threshold.

108. (Original) The computer-readable media of claim 107 wherein the rate of gain adjustment is decreased at about 0.1-0.3 dB/sec when the reference value is less than the clipping threshold but greater than a predetermined maximum comfort level.

109. (Original) The computer-readable media of claim 102 wherein a rate of gain adjustment is logarithmically increased at about 0.1-0.3 dB/sec when the reference value is

below a predetermined minimum comfort level and above a noise floor.

110. (Original) The computer-readable media of claim 102 wherein the signal with gain comprises first and second plurality of samples, the first samples preceding the second samples in time, and the reference value generation comprises not changing the reference value if the estimated power level for the second samples exceeds the estimated power level for the first samples by a threshold.